

## **R E M A R K S**

The office action of January 23, 2008, has been reviewed and its contents carefully noted. Reconsideration of this case, as amended, is requested. Claims 1-4, 12-38 and 47 remain in this case.

### **Preliminary Comments**

- a. Claim 1 was amended to address the problem raised in the objection.
- b. Claims 1 and 15 were further amended to better define the invention and distinguish from the prior art, and dependent claims 2-4 and 34, 37 and 38 were amended accordingly.

Specifically:

1. the types of metadata in claim elements 1(a)(iv) (and corresponding element 15(a)(iv)(a)(4)) have been moved from the first part of element 1(a) (15(a)(iv)(a)) to the individual element to which they apply
2. a new element 1(a)(v) (and 15(a)(iv)(a)(5)) has been added to more clearly, positively and explicitly claim the novel “metadata on the metadata” of Applicants’ invention.
3. dependent claims 2-4 (and their equivalents 34 and 37-38) were amended to change their dependency to further refine the metadata on metadata of the newly-added element 1(a)(v) or 15(a)(iv)(a)(5)

This now positively claims the “metadata on metadata”, which was previously claimed as a relationship in the first “wherein clause” (“wherein the metadata in the metadata database define the instances in the metadata database...”). The “wherein” in that clause was changed to –such that--, since the relationship is now positively claimed. This is consistent with the application as filed (Table 1, for example) and all of Applicants’ arguments in the office action responses and interviews to date. No new matter is added by this amendment.

- c. The tables attached to the previously filed Section 131 affidavit have been re-annotated in accordance with these amended claims and are attached hereto as “Appendix A”.
- d. The numbered paragraphs below correspond to the numbered paragraphs in the Office Action.

### **Claim Objection**

18. Claim 1 was objected to because it recited "encoded computer-readable medium", the Examiner stating that the Specification fails to provide support for this term.

The claim has been amended to change "encoded computer-readable medium" to "computer-readable data repository". While exactly this phrase is not used in exactly that form, the person having ordinary skill in the art would find support for this throughout the specification and drawings as filed. For example, the repository (26) is shown in figure 26 by the flowchart symbol for computer disk storage. The entire application recites how computer software and encoding methods (i.e. XML) are used with the World Wide Web (i.e. computer network) to access (i.e. read) the data stored in the repository, which must therefore by definition be computer-readable.

The field of the invention states,

The present invention relates generally to databases and *the electronic storage* and retrieval of information related to materials and their properties.

The summary of the invention states,

The system of the invention provides a method, *preferably implemented in computer software*, for the delivery, *storage*, maintenance and controlled access to data on materials, *stored* in a centrally administered *data repository*.

Applicant believes that this amendment overcomes the objection to claim 1. Reconsideration and withdrawal of the objection is respectfully requested.

## Section 131 Declaration

3. Applicants submitted a Declaration of the Inventors under Section 131 with the last Office Action Response, filed on October 30, 2007. The Examiner declared that this affidavit was considered ineffective to overcome the Rappold reference.

Applicants respectfully disagree.

In order to overcome the Rappold reference, the Section 131 declaration needs to establish that the Applicants had invented the subject invention prior to the effective date of the Rappold reference. That is, that the Applicants had both conceived and reduced the claimed invention to practice prior to that date.

The Examiner has stated that the Section 131 declaration is sufficient to support the date of conception. This leaves only the date of reduction to practice. Applicants believe that they have sufficiently supported a date of reduction to practice in the declaration which is before the effective date of the Rappold reference.

Claim 1, claims a data repository storing specific data in a specific way. Exhibit D to the declaration provided a printout of a data repository meeting every limitation of the claim, and the declaration stated that the data repository was implemented as a Microsoft Access database at least as early as September 19, 2002. These are *facts* which support the *fact* that the invention was reduced to practice – that is, that the tables provided in the exhibit are a repository, and that a working model existed. Therefore, the invention was reduced to practice – it is not necessary that a commercial product be on the market or that every bug be worked out to reduce the invention to practice. This is especially true in this case where the claimed invention is a depository storing data in a certain way and the declaration provided facts that there was indisputably a depository in existence which stored the claimed data in the claimed way.

Similarly, the facts provided in the declaration – *both* the supporting exhibits *and the statements of the Applicants made under penalty of perjury in the declaration* show implementation of the method claimed in claim 15.

Applicants' statement in the declaration that the repository existed and that a working system was produced and entered into testing, being statements made under oath with supporting exhibits, are *facts*, and should be accepted as such.

Applicants believe that the Section 131 declaration has sufficiently proven a date of invention early enough to remove the Rappold reference from consideration as prior art. Reconsideration and withdrawal of the rejection is respectfully requested.

However, even if the Examiner still believes the Section 131 declaration to be insufficient, the Applicants believe the Rappold reference (and all the other cited references) do not show the Applicants invention as claimed in the claims as amended, and the invention is patentable over the art for the reasons explained below.

### **Rejection(s) under 35 U.S.C. §103**

23. The prior art rejections of all of the remaining claims under 35 U.S.C. 103(a) were maintained from the previous office actions. Specifically, claims 1-4 and 12-14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rappold, III (US PGPub 2004/0117397) in view of Arritt et al. (US PGPub 2005/0131861) and further in view of the dissertation titled "Pulsed DC Reactive Magnetron Sputtering of Aluminum Nitride Thin Films" by Jung Won Cho.
24. Claims 15-19, 21-26, 28-30, 34-38, and 47 were rejected under 35 U.S.C. 103(a) as being unpatentable over the above references in further view of Boyd et al.(US PGP 2003/0069795).
25. Claim 20 was rejected under 35 U.S.C. 103(a) as being unpatentable over the all of the above in further view of Markki et al. (US PGPub 2004/0243580).
26. Lastly, claims 27, and 31-33 were rejected under 35 U.S.C. 103(a) as being unpatentable over the references cited above in the rejection of claim 15 in further view of O'Hare et al. (US 6,484,173).

Applicant believes that the previously-submitted Declaration under 37 C.F.R. §1.131 and Exhibits A-F provided sufficient evidence to show that the date of invention was prior to the filing date of Rappold (December 16, 2002), and also Markki (May 27, 2003), for the reasons stated above. For these reasons, as stated above, Applicants believe that Rappold, the base reference for all of the obviousness rejections, should not be available as a reference due to Applicants' prior invention and the rejection of the application over Rappold and Markki should be overcome.

With those references removed from consideration, Applicant believes that the present invention is not rendered obvious over the remaining references (Arritt and Cho, as well as Boyd), for the reasons expressed in the prior Office Action responses and the interviews with the Examiner on October 26, 2006, November 6, 2006 and October 22, 2007.

However, Applicants' also believe that even if Rappold were available as a reference, the invention claimed in independent claims 1 and 15, as amended, is patentable over the references cited.

Claims 1 and 15 have been amended to more clearly define the novel "metadata on metadata" feature of the invention, which Applicant believes is not shown or taught by any of the prior art, alone or in combination. Specifically, claim 1(a) (and corresponding claim 15(a)(iv)(a)) now recites:

- a) a metadata database in the form of instances with associated metadata giving information about the instances, the metadata comprising at least one data element selected from a list comprising name, description, and identifying information, the metadata database comprising:
  - i) metadata on the material;
  - ii) metadata on the sample;
  - iii) metadata on the test;

- iv) metadata on data value elements in a test result database further comprising at least one data element selected from a list comprising data type, units, acceptable values or ranges, and default value; and
- v) *metadata on the metadata, comprising at least one data element describing the metadata on the material, sample, test and data value elements in the metadata database;*

Neither Rappold's application nor the other cited references discloses or teaches the novel "metadata on metadata" feature of the invention claimed in independent claims 1 and 15 of the present application, as amended.

The data table (50) in Rappold's system corresponds to the test result database in Applicants' invention (claim 1(b), or claim 15(a)(iv)(b)), in that each of the instances in the data table is information about a user (analogous to one of a material, sample or test) comprising a data element identifying the user (material, sample or test) and a data value element, which in all cases in Rappold is a single data point.

The Examiner identified elements corresponding to claim 1(a)(i) through (iv) – "First" corresponding to metadata on the material (1(a)(i)), "Username" corresponding to metadata on the sample (1(a)(ii)) and "Extension" corresponding to metadata on the test (1(a)(iii)), and "string" as "metadata on data value elements in a test result database" as claimed in claim 1(a)(iv).

Since Rappold's database isn't a repository of materials property data, the assignment of parts of a list of users and their phone numbers in Rappold to the claimed metadata on materials, samples and tests in a materials property database in the Applicants' invention is arbitrary at best. However, one can allow for arguments' sake that Rappold shows metadata on different kinds of data elements within the contexts of his system and has at least one value of predefined metadata on data value elements ("string").

What is missing from Rappold (and Arritt, Cho, Boyd, Markki, O'Hare and all other references cited or known to Applicants) is the "metadata on metadata" feature, claimed in the newly added parts of claim 1 and 15 - that is, Claim 1(a)(v) and Claim 15(a)(iv)(a)(5) - "metadata

*on the metadata, comprising at least one data element describing the metadata on the material, sample, test and data value elements in the metadata database" ... "such that the metadata in the metadata database define the instances in the metadata database".*

The Examiner identified paragraph [0029] in Rappold as showing the “wherein the metadata in the metadata database define the instances in the metadata database...” Applicants respectfully disagree with this statement, and suggest that only hindsight based on Applicants’ invention would lead anyone to read this into the description in Rappold. Paragraph [0029] of Rappold says:

[0029] The other component of the extensible database system shown in FIG. 1 is metadata table 11. Metadata table 11 is comprised of metadata table rows 101a-101d and columns 111, 113, and 115. *Each row 101 of Metadata table 11 provides parameters and formatting information for one attribute type stored in data table 10.* Column 111 holds numbers representing the attribute type whose parameters and formatting information is provided on that particular row 101 of metadata table 11. These correspond to the entries in column 114 of data table 10, as illustrated by the connections between entry 111a in metadata table 11 and entries 114a and 114e in data table 10. Both data table rows 100a and 100e hold first names, which are of attribute type "1". As shown by entry 111a, metadata table row 101a provides formatting information for this attribute type, attribute type "1", or first names. *Likewise, the other metadata table rows, rows 101b-101d, also provide parameters and formatting information for other data table rows 100.* [emphasis added]

As can be clearly seen from this paragraph and from the data in Figure 4, Rappold teaches a metadata table 11 providing “*parameters and formatting information for one attribute type stored in data table 10*”. There is no mention in this paragraph, or anywhere else in Rappold, that the metadata in the metadata table could provide any information *about the other metadata in the metadata table.*

This distinction between metadata on the elements in the data table (as done by Rappold) and “metadata on metadata” of Applicants’ invention is clearly shown in the database tables provided as exhibit “D” to the Section 131 declaration filed on October 30, 2007:

Pages D7-D9 and D11 show the test result database (pages D7-D9 corresponding to claim 1(b)(i) and page D11 corresponding to claim 1(b)(ii)).

Pages D1-D6 and D10 show the metadata table, with pages D4-6 and D10 showing the metadata on the data table analogous to Rappold’s system:

- Page D4 shows a table of “metadata on the material” (claim 1(a)(i)) – for example, see line 2 of the table, giving metadata on sample EXP23569, corresponding to the instance of line 2 of the test result database sample table on page D10
- Page D10 shows a table of “metadata on the sample” (claim 1(a)(ii)) – for example, see line 2, giving metadata on sample ID 5233, which corresponds to line 1 of the test result database property measurement table on page D7-D8.
- Page D5 shows a table of “metadata on the test” (claim 1(a)(iii)) – for example, see the line starting “Speed” (ID 8), which corresponds to the “parameter ID” entry on lines 1, 3, 5, 7 and 9 of the test result database property measurement table on page D9.
- Page D6 shows a table of “metadata on the data value element” (claim 1(a)(iv)) – for example, see the line for ID 201 “Compressive Modulus”, which corresponds to the “property result ID” on lines 3, 6 and 9 of the test result database property measurement result table on page D11.

As can be seen, each of the metadata database tables detailed above give *metadata about the data in the test results database*. In contrast, pages D1 to D3 show tables of “metadata on metadata in the metadata database” according to the present invention (claims 1(a)(v) and 15(a)(iv)(a)(5)):

- Page D1 shows a table giving metadata on metadata about suppliers – specifically, see the second line of the table, which says that supplier “Dow Chemicals” is ID number 2, and has a website URL of [www.dow.com](http://www.dow.com). This gives metadata on the metadata “Dow Chemicals” which appears in the metadata database table of “metadata on material” shown on page D4, lines 2-4. Similarly, line 1 of the table on D1 gives metadata on the metadata “Owens Corning” on line 1 of the table on D4.
- Page D2 shows a table giving metadata on metadata about materials subclasses. Looking at the fourth line of the table, one can see metadata on subclass “PP” (it is in class “plastic”, and has ASTM name “PP”). This is metadata on the metadata “PP” which appears in the metadata database table on page D4, lines 2-4.
- Page D3 shows a table giving metadata on metadata about material properties. This is metadata on the metadata appearing on the “metadata on tests” table on page D5. For example, the metadata “Coefficient of Friction”, appearing on lines 2-3 of the table on page D5, has metadata on metadata on line 3 of the table on page D3. Metadata on the other metadata in column 4 of the table on page D5 can similarly be found in the table on page D3.

Neither Rappold, nor Arritt, nor Cho, nor Makki, nor O'Hare teach, show or suggest the Applicants' metadata on metadata feature as used in a data repository for material property data. Therefore, the combination of the references cannot supply which every one of them lacks.

Reconsideration and withdrawal of the obviousness rejection of claims 1-4, 11-38, 41-42, and 47 are therefore respectfully requested.

## Conclusion

Applicant believes the claims, as amended, are patentable over the prior art, and that this case is now in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with Applicants' attorney would advance the prosecution of the case to finality, she is invited to telephone the undersigned at the number given below.

Respectfully Submitted:  
Hubert Lobo and Kurien Jacob

By: /mfb #29619/  
Michael F. Brown, Reg. No. 29,619  
Attorney for Applicant  
BROWN & MICHAELS, P.C.,  
400 M&T Bank Building, 118 N. Tioga St.  
Ithaca, NY 14850  
(607) 256-2000 • (607) 256-3628 (fax) • e-mail: docket@bpmlegal.com  
Dated: July 8, 2008

## **Appendix A**

**“Exhibit D” from Section 131 Declaration**

**Annotated to Correspond to Claims as Amended in this Response**

**Appendix is on Pages D1-D11 following this cover sheet**

## Exhibit D - page D1

| SupplierID | SupplierName  | Material Supplierurl |
|------------|---------------|----------------------|
| 1          | Owens Corning |                      |
| 2          | Dow Chemicals | www.dow.com          |
| 3          | BASF          |                      |
| 4          | ALCOA         |                      |

Material Supplier

## Exhibit D - page D2

Material Subclass

10/22/2007

| ISO Name | ASTM Name | Class   | Group |
|----------|-----------|---------|-------|
| PE-HD    | HDPE      | Plastic |       |
| PE-LD    | LDPE      | Plastic |       |
| PC       | PC        | Plastic |       |
| PP       | PP        | Plastic |       |

## Exhibit D - page D3

| Name   | Category   | Description      |
|--|------------|------------------|
| Capillary Viscosity                          | Flow       | Viscous behavior |
| Charpy Impact                                | Mechanical | None             |
| Coefficient of Friction                      | Mechanical | None             |
| Coefficient of Linear Thermal Expansion      | Thermal    | None             |
| Compressive Creep                            | Mechanical | None             |
| Compressive Properties                       | Mechanical | None             |
| Dynamic Mechanical Properties in Torsion     | Mechanical | None             |
| Flexural Creep                               | Mechanical | None             |
| Flexural Fatigue                             | Mechanical | None             |
| Flexural Properties                          | Mechanical | None             |
| Heat Deflection Temperature                  | Thermal    | None             |
| Instrumented Dart Impact                     | Mechanical | None             |
| Izod Impact                                  | Mechanical | None             |
| Melt Rheology by Dynamic Mechanical Analysis | Flow       | None             |
| Planar Tension                               | Mechanical | None             |
| Shear Strength                               | Mechanical | None             |
| Specific Heat                                | Thermal    | None             |
| Stress Relaxation                            | Mechanical | None             |
| Tensile Creep                                | Mechanical | None             |
| Tensile Properties                           | Mechanical | None             |
| Thermal Analysis                             | Thermal    | None             |
| Thermal Conductivity                         | Thermal    | None             |
| Thermal Diffusivity                          | Thermal    | None             |
| Vicat Softening Temperature                  | Thermal    | None             |

Claim 1(a)(v) - Metadata on Metadata on Material Properties

## Exhibit D - page D4

Material

10/22/2007

| Name                  | Class         | Subclasses | Specifications | Manufacturer    | Terms | Notes         | Formula | Applications |
|-----------------------|---------------|------------|----------------|-----------------|-------|---------------|---------|--------------|
| E-Glass               | Glass         |            | Owens Corning  | E type Glass US |       |               |         |              |
| <del>EXP 233569</del> | Plastic       | PP         | Dow Chemicals  |                 |       | Polypropylene |         |              |
| ProFax 6323           | Plastic       | PP         | Dow Chemicals  |                 |       | Polypropylene |         |              |
| Test1                 | Thermoplastic | PP         | Dow Chemicals  |                 |       |               |         |              |

Claim 1(a)(i) - Metadata on Material

## Exhibit D - page D5

| Name          | ID  | Techniqu | Property Name           | Category       | Type    | Units | Numeric | Numeric | Numeric | Numeric |
|---------------|-----|----------|-------------------------|----------------|---------|-------|---------|---------|---------|---------|
| Temperature   | 1   | R-011A   | Capillary Viscosity     | Test Parameter | Numeric | C     | 23      | 4005    |         |         |
| Substrate     | 2   | M-060A   | Coefficient of Friction | Test Parameter | String  |       |         |         |         |         |
| Speed         | 3   | M-060A   | Coefficient of Friction | Test Parameter | Numeric | mm/mi | 50      | 5       | 5002    |         |
| Substrate     | 4   | M-060I   | Tensile Creep           | Test Parameter | String  |       | 0       | 0       |         |         |
| Speed         | 5   | M-060I   | Coefficient of Friction | Test Parameter | Numeric | mm/mi | 100     | 5       | 5000    |         |
| Conditioning  | 6   | M-060A   | Coefficient of Friction | Specimen Detai | String  |       | 0       | 0       |         |         |
| Conditioning  | 7   | M-060I   | Coefficient of Friction | Specimen Detai | String  |       | 0       | 0       |         |         |
| Speed         | 8   | M-210A   | Compressive Properti    | Test Parameter | Numeric | mm/mi | 5       | 1       | 5000    |         |
| Surface       | 9   | M-210A   | Compressive Properti    | Test Parameter | String  |       | 0       | 0       |         |         |
| Recycling     | 10  | M-210A   | Compressive Properti    | Test Parameter | String  |       | 0       | 0       |         |         |
| Temperature   | 11  | M-210A   | Compressive Properti    | Test Parameter | Numeric | C     | 23      | -70     | 2500    |         |
| Specimen Type | 12  | M-210A   | Compressive Properti    | Specimen Detai | String  |       |         | 0       |         |         |
| Specimen Ori  | 13  | M-210A   | Compressive Properti    | Specimen Detai | String  |       |         | 0       |         |         |
| Specimen Con  | 14  | M-210A   | Compressive Properti    | Specimen Detai | String  |       |         | 0       |         |         |
| ***START      | 50  |          | Capillary Viscosity     | Test Parameter | String  |       |         |         |         |         |
| Specimen Test | 101 |          | Tensile Properties      | Specimen Detai | String  |       |         |         |         |         |
| Specimen Con  | 102 |          | Tensile Properties      | Specimen Detai | String  |       |         |         |         |         |
| Other Specime | 103 |          | Tensile Properties      | Specimen Detai | String  |       |         |         |         |         |
| Specimen Ori  | 104 |          | Tensile Properties      | Specimen Detai | String  |       |         |         |         |         |
| Test Temperat | 105 |          | Tensile Properties      | Test Parameter | Numeric | °C    | 23      |         | 0.0     |         |
| Laboratory Hu | 106 |          | Tensile Properties      | Test Parameter | Numeric | %     |         |         | 0.0     |         |
| Crosshead Spe | 107 |          | Tensile Properties      | Test Parameter | Numeric | mm/mi | 5       |         | 3       |         |
| Extensometry  | 108 |          | Tensile Properties      | Test Parameter | String  |       |         |         |         |         |
| Specimen Test | 201 |          | Compressive Properti    | Specimen Detai | String  |       |         |         |         |         |
| Specimen Con  | 202 |          | Compressive Properti    | Specimen Detai | String  |       |         |         |         |         |
| Other Specime | 203 |          | Compressive Properti    | Specimen Detai | String  |       |         |         |         |         |
| Test Temperat | 205 |          | Compressive Properti    | Test Parameter | Numeric | °C    | 23      |         | 0.0     |         |
| Laboratory Hu | 206 |          | Compressive Properti    | Test Parameter | Numeric | %     |         |         | 0.0     |         |
| Crosshead Spe | 207 |          | Compressive Properti    | Test Parameter | Numeric | mm/mi | 1.3     |         |         |         |
| Extensometry  | 208 |          | Compressive Properti    | Test Parameter | String  |       |         |         |         |         |
| Specimen Test | 301 |          | Flexural Properties     | Specimen Detai | String  |       |         |         |         |         |
| Specimen Con  | 302 |          | Flexural Properties     | Specimen Detai | String  |       |         |         |         |         |
| Other Specime | 303 |          | Flexural Properties     | Specimen Detai | String  |       |         |         |         |         |

Claim 1(a)(iii) - Metadata on Test

## Exhibit D - page D6

| ID  | Property Name          | Name  | Result  | Summary | Definition  | Table | Plot |
|-----|------------------------|---|---------|---------|---|-------|------|
| 1   | Compressive Properties | Compressive Modulus                         | Numeric | —       | Compressive modulus is the slope of the stress-strain curve over a          | ✓     |      |
| 2   | Compressive Properties | Compressive Strength                        | Numeric | —       | This is the maxima  | ✓     |      |
| 3   | Dynamic Mechanical Pr  | G'G" Plot                                   | XYMatr  | —       | Visco-elastic properties representing the low frequency behavior            | ✓     | Symb |
| 4   | Dynamic Mechanical Pr  | Tan Delta Plot                              | XYMatr  | —       | Visco-elastic properties representing the high frequency behavior           | ✓     | Symb |
| 5   | Capillary Viscosity    | Cross Model                                 | XYZ Eqn | ✓       | 4 coeff viscosity model   | ✓     | Line |
| 101 | Tensile Properties     | Tensile Modulus                             | X       | —       | The slope of the stress-strain curve over a                                 | ✓     |      |
| 102 | Tensile Properties     | Tensile Modulus - Young's                   | X       | —       | The slope of the initial, linear portion of the stress-strain curve         | ✓     |      |
| 103 | Tensile Properties     | Tensile Modulus - Secant                    | X       | —       | The ratio of the stress to the strain at a give                             | ✓     |      |
| 104 | Tensile Properties     | Offset Yield Stress in Tension              | X       | —       | The stress at the intercept of the stress-strain curve                      | ✓     |      |
| 105 | Tensile Properties     | Offset Yield Strain in Tension              | X       | —       | The strain at the intercept of the stress-strain curve                      | ✓     |      |
| 106 | Tensile Properties     | Tensile Strength at Yield                   | X       | —       | The stress at a local maxima on the stress-strain curve                     | ✓     |      |
| 107 | Tensile Properties     | Tensile Strain at Yield                     | X       | —       | The strain at which the stress reaches a local maximum                      | ✓     |      |
| 108 | Tensile Properties     | Tensile Strength at Break                   | X       | —       | The stress at which the specimen broke                                      | ✓     |      |
| 109 | Tensile Properties     | Tensile Strain at Break                     | X       | —       | The strain at which the specimen broke                                      | ✓     |      |
| 110 | Tensile Properties     | Poisson's Ratio                             | X       | —       | The ratio of the transverse (contraction) stress to the longitudinal stress | ✓     |      |
| 111 | Tensile Properties     | Engineering Tensile Stress-Strain Curve     | XY      | —       | Stress (load / initial cross-sectional area) vs strain                      | Line  |      |
| 112 | Tensile Properties     | True Tensile Stress-Strain Curve            | XY      | —       | True stress (engineering stress adjusted for specimen thickness)            | Line  |      |
| 113 | Tensile Properties     | Engineering Tensile Stress-Strain Curve     | XY      | —       | Reduced set of points from the engineering stress-strain curve              | ✓     |      |
| 114 | Tensile Properties     | True Tensile Stress-Strain Data             | XY      | —       | Reduced set of points from the true stress-strain curve                     | ✓     |      |
| 201 | Compressive Properties | Compressive Modulus                         | X       | —       | The slope of the initial, linear portion of the stress-strain curve         | ✓     |      |
| 202 | Compressive Properties | Compressive Modulus - Young's               | X       | —       | The slope of the stress-strain curve over a                                 | ✓     |      |
| 203 | Compressive Properties | Compressive Modulus - Secant                | X       | —       | The ratio of the stress to the strain at a given stress                     | ✓     |      |
| 204 | Compressive Properties | Offset Yield Stress in Compression          | X       | —       | The stress at the intercept of the stress-strain curve                      | ✓     |      |
| 205 | Compressive Properties | Offset Yield Strain in Compression          | X       | —       | The strain at the intercept of the stress-strain curve                      | ✓     |      |
| 206 | Compressive Properties | Compressive Strength at Yield               | X       | —       | The stress at a local maxima on the stress-strain curve                     | ✓     |      |
| 207 | Compressive Properties | Compressive Strain at Yield                 | X       | —       | The strain at which the stress reaches a local maximum                      | ✓     |      |
| 211 | Compressive Properties | Engineering Compressive Stress-Strain Curve | XY      | —       | Stress (load / initial cross-sectional area) vs strain                      | Line  |      |
| 212 | Compressive Properties | True Compressive Stress-Strain Curve        | XY      | —       | True stress (engineering stress adjusted for specimen thickness)            | Line  |      |
| 213 | Compressive Properties | Engineering Compressive Stress-Strain Curve | XY      | —       | Reduced set of points from the engineering stress-strain curve              | ✓     |      |
| 214 | Compressive Properties | True Compressive Stress-Strain Curve        | XY      | —       | Reduced set of points from the true stress-strain curve                     | ✓     |      |
| 301 | Flexural Properties    | Flexural Modulus                            | X       | —       | The slope of the stress-strain curve over a                                 | ✓     |      |
| 302 | Flexural Properties    | Flexural Modulus - Young's                  | X       | —       | The slope of the initial, linear portion of the stress-strain curve         | ✓     |      |
| 303 | Flexural Properties    | Tensile Modulus - Secant                    | X       | —       | The ratio of the stress to the strain at a given stress                     | ✓     |      |

## Exhibit D - page D7

Property Measurement

10/22/2007

| ID   | Sample ID | Property Name   | Measurement Technique ID | ProviderRefID | Data Provider | Measurement Instru    |
|------|-----------|-----------------|--------------------------|---------------|---------------|-----------------------|
| 1001 | 5233      | Specific Heat   | T-015A                   | 3443          | DatapointLabs | Perkin Elmer          |
| 1002 | 5233      | Dynamic Mech    | M-210A                   | 3443          | DatapointLabs | Rheometrics ARES      |
| 1003 | 5233      | Capillary Visco | M-210A                   | 3443          | DatapointLabs | Goettfert Capillary R |
| 2001 | 5774      | Capillary Visco | R-011A                   | 3443          | DatapointLabs | Goettfert Rheograph   |

Claim 1(b)(i) - Test Result Database  
data elements on material, sample and test  
(half of table - see page D8 for additional columns)

Page D8 adjoins here

**Exhibit D - page D8**  
**Page D7 adjoins above**

Property Measurement

10/22/2007

| Measurement Date | MeasuredBy | CertifiedBy | Accredited                          | Notes |
|------------------|------------|-------------|-------------------------------------|-------|
| 3/15/2002        | CM         | TB          | <input checked="" type="checkbox"/> |       |
| 2/3/2002         | HL         | TB          | <input checked="" type="checkbox"/> |       |
| 3/15/2002        | JJA        | TB          | <input checked="" type="checkbox"/> |       |
| 8/15/2002        | JA         | TB          | <input checked="" type="checkbox"/> |       |

Continuation of table from page D7

## Exhibit D - page D9

| ID   | Parameter ID | Measurement ID  | Value | Parameter Tuple ID |
|------|--------------|-----------------|-------|--------------------|
| 1000 | 8            | 10015<br>100123 |       | 354                |
| 1001 | 11           | 10015           |       | 354                |
| 1002 | 8            | 10015           |       | 355                |
| 1003 | 11           | 100160          |       | 355                |
| 1004 | 8            | 10015           |       | 356                |
| 1005 | 11           | 1001100         |       | 356                |
| 1006 | 8            | 100150          |       | 357                |
| 1007 | 11           | 100123          |       | 357                |
| 1008 | 8            | 1001500         |       | 358                |
| 1009 | 11           | 100123          |       | 358                |
| 2001 | 2110         | 2001220         |       | 101                |
| 2002 | 2110         | 2001240         |       | 101                |
| 2003 | 2110         | 2001260         |       | 101                |

Claim 1(b)(i) - Test Results Database  
Data Elements on materials, samples, tests

## Exhibit D - page D10

Sample

10/22/2007

| SampleID | MaterialNameA | AliasName   | Sample Identifier | Sample Source | Form           | Geometry                           |
|----------|---------------|-------------|-------------------|---------------|----------------|------------------------------------|
| 5224     | EXP 23569     | ProFax 6323 | Lot# 2356         | Dow Chemical  | ASTM D790 flex | 5" long, 12.5 mm wide, 3.16 mm thi |
| 52330    | EXP 23569     | ProFax 6323 | Lot# 2356         | Dow Chemical  | ASTM Typ1 Te   | 12.5 mm wide, 3.16 mm thick        |
| 5554     | EXP 23569     | ProFax 6323 | Injection Morde   | Black&Decker  | pellets        | na                                 |
| 5774     | Test1         |             |                   |               | pellets        |                                    |

Claim 1(a)(ii) - Metadata on Sample

## Exhibit D - Page D11

| ID  | Property Measurement ID | Property Result ID | Result Value            | Result Type    | Result Notes |
|-----|-------------------------|--------------------|-------------------------|----------------|--------------|
| 1   | 1001                    | 211                | 10.25.1, 100, 12.2      | Value          | Eng ss       |
| 2   | 1001                    | 212                | 10.20.3, 100,11.5       | Value          | True ss      |
| 3   | 1001                    | 201                | 123                     | Value          | Modulus      |
| 4   | 1001                    | 211                | 10.25.1, 100, 12.2      | Value          | Eng ss       |
| 5   | 1001                    | 212                | 10.20.3, 100,11.5       | Value          | True ss      |
| 6   | 1001                    | 201                | 125                     | Value          | Modulus      |
| 7   | 1001                    | 211                | 10.25.1, 100, 12.2      | Representative | Eng ss       |
| 8   | 1001                    | 212                | 10.20.3, 100,11.5       | Representative | True ss      |
| 9   | 1001                    | 201                | 128                     | Representative | Modulus      |
| 101 | 2001                    | 2101               | 52.88126307,277.141640  | Value          |              |
| 102 | 2001                    | 2101               | 53.01389209,207.336220  | Value          |              |
| 103 | 2001                    | 2101               | 52.499668912,174.482432 | Value          |              |
| 104 | 2001                    | 2111               | 0.32309,,2.258E+04,Pa,6 | Value          |              |

Claim 1(b)(ii) - Data Value Elements